UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,876	06/14/2005	Roberto Gemello	09985.0368-00000	8785

22852   7590   09/12/2008
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EXAMINER
YEN, ERIC L

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
09/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *13 June 2008*.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
    closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *14-22 and 25-35* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *14-20 and 25-33* is/are rejected.

7) ☒ Claim(s) *21-22, 34-35* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

    1. ☐ Certified copies of the priority documents have been received.

    2. ☐ Certified copies of the priority documents have been received in Application No. _____.

    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the Office Action mailed 3/13/08, applicant has submitted an
amendment filed 6/13/08.

Claims 14, 15, 19-21, and 25, have been amended. New Claims 27-35 have
been added. Claims 23-24 have been cancelled.

Response to Arguments

2.   Applicant's arguments filed 6/13/08 have been fully considered but they are not
persuasive.

Applicant argues assorted details related to motivation and the ability to combine
references (Amendment, page 9).

While the motivation statements may be phrased in a conclusive manner, the
point and benefit of combining the teachings of the secondary reference with the
primary reference are still clear. Eberman teaches a system and features which
contribute to the ability to naturally represent clean speech, and also says that this is a
desirable feature in speech analysis. Therefore, if one of ordinary skill in the art working
on a speech processing system would find this feature "desirable", then there is some
benefit to incorporating this feature and so one of ordinary skill would have been
motivated to combine the teachings of the references based on this rationale.

Applicant argues that "Li also does not disclose Applicants' claimed method of executing a neural network in correspondence to at least one frame between said non-consecutive frames, and calculating [a] distance as a distance between output likelihoods of said neural netwwork", because "instead, Li simply discloses 'two well-known encoding techniques' for encoding syllabic features... The two well-known encoding techniques disclosed in Li are variable frame encoding and arc-length encoding", and that "This is clearly different from Applicants' claimed 'selectively skipping a run of the neural network in correspondence to at least one frame between said non-consecutive frames" (Amendment, page 10).

The examiner respectfully disagrees, primarily because applicant has provided no explanation as to why variable frame encoding, arc-length encoding, and any of their respective functions do not read on the claim language.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicant's simple assertion that "this is clearly different..." contains no reasoning, technical, or legal analysis as to why a broad, reasonable, interpretation of the claim language cannot be used to describe the cited portions of Li applied to teach certain claim limitations.

Furthermore, applicant simply cited col. 6, lines 56-63 and restated the contents of the passage without actually addressing the portions cited by the previous examiner (specifically, col. 6, line 64 - col. 7, line 10; Col. 4, lines 25-35; Col. 3, lines 20-35).

The portion of Li described in col. 4, lines 25-35 describe successive operations where the first is a nearest neighbor operation usable in conjunction with an ANN analysis. Nearest neighbor operations are generally done using some sort of distance (i.e., the less similar two things are, then the longer the distance), and in col. 6, line 64 - col. 7, line 10, Li teaches discarding frames that "exceed a specific threshold distance" before moving on to the next frame.

This teaches/suggests where, for example, a nearest neighbor operation is performed before an ANN operation. If a frame is discarded because the threshold distance is exceeded during the nearest neighbor operation, then it, therefore, cannot be analyzed by the neural network operation, which means that for that frame ("in correspondence to at least one frame") there is no neural network operation ("run") and therefore, the neural network operation is "skipped". As long as there are at least two frames which are not discarded existing with at least one discarded frame between them, then the limitation "between said non-consecutive frames" is read on.

Applicant then argues that "it is not clear whether or how the probabilities in Eberman could be used in conjunction with the variable frame encoding and the arc-length encoding disclosed in Li" (Amendment, page 11).

The examiner respectfully disagrees. A deeper analysis than that provided by applicant with regards to the passage cited by applicant in col. 6, lines 56-63 of Li shows that the variable frame encoding and arc-length encoding are not the only two speech coding methods applicable to Li, as show by the phrase "Both such encoding techniques have been found to work with the invention, and others will be apparent to those skilled in the art". Therefore, the system described in Li isn't necessarily either of those two forms of encoding as argued by applicant and therefore, it need not be that the probabilities are combined with such systems as argued by applicant. Eberman describes the use of distances and likelihoods/probabilities in some sort of speech analysis system which could easily fall within the scope of the "others" mentioned above.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 14 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065).

Consider claims 14 and 27 (and the above 101 rejections): Li discloses a method of executing a neural network in a speech processing system for processing speech of an input speech signal organized into a series of frames **(see Col. 4, lines 25-35, where Li discusses a neural network; Col. 3, lines 20-35, where Li discusses a speech processing system using frames)**, comprising: evaluating a distance between non-consecutive frames and selectively skipping a run of the neural network in correspondenceto at least one frame between said non-consecutive frames; and calculating said distance as a distance between outputs of said neural network **(see Col. 6, line 64 – Col. 7, line 10, where Li discusses evaluating a distance and discarding)**.

Li does not specifically disclose likelihoods for recognizing speech, however Eberman discloses likelihoods for recognizing speech **(see Col. 4, lines 16-29, where Eberman discusses distance represents a likelihood, in a speech recognition system)**. It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, and use likelihoods as taught by Eberman, thus providing a speech processing system where clean speech signals can naturally be represented, as discussed by Eberman **(see Col. 3, lines 61-67)**.

3.   Claims 15-17, 25, 28-30, are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) as applied to claim 14 above, and further in view of Chen (US 4,379,949).

Consider claims 15 and 25 (and the above 101 rejection): Li and Eberman disclose a) buffering a plurality of input frames **(see Col. 5, lines 49-66, where Li**

discusses using 5 sequential frames as input, therefore buffering); b) defining an

interval corresponding initially to a main interval of frames delimited by a first and a

second non-consecutive buffered frames **(see Col. 6, line 64 – Col. 7, line 10, where**

Li discusses non-adjacent frames); c) calculating, by means of said neural network, a

first and a second likelihood corresponding to the frames delimiting said interval **(see**

Col. 4, lines 16-29, where Eberman discusses distance represents a likelihood); d)

calculating a distance between said first and second likelihoods **(see Col. 6, line 64 –**

Col. 7, line 10, where Li discusses evaluating a distance); e) comparing said

distance with a predetermined threshold value and, in case said distance is lower than

said threshold value, calculating the likelihood or likelihoods corresponding to the frame

or frames within said interval, or, in case said distance is greater than said threshold

value, calculating, by means of said neural network, at least one likelihood

corresponding to a frame within said interval **(see Col. 6, lines 60-67, where Li**

discusses a threshold); and f) applying recursively said steps c) to e) to each interval

present as a sub-interval within said main interval containing at least one frame whose

likelihood has not been yet calculated, until all the likelihoods corresponding to the

frames in said main interval have been calculated **(see Fig. 3, where Li shows a**

retraining loop, therefore recursive steps).

Li and Eberman do not specifically disclose interpolating, however Chen discloses

interpolating **(see Col. 5, lines 21-45, where Chen discusses an interpolation**

between frames). It would have been obvious to one skilled in the art at the time the

invention was made to modify the invention of Li and Eberman, and use interpolating as

taught by Chen, thus reducing the bandwidth necessary, as discussed by Chen **(see Col. 3, lines 27-38)**.

Consider claim 16: Li, Eberman, and Chen disclose a linear interpolation **(see Col. 5, lines 21-45, where Chen discusses a linear interpolation)**.

Consider claim 17: Li, Eberman, and Chen disclose a main interval of frames comprises said plurality of buffered input frames **(see Col. 6, lines 56-67, where Li discusses variable frame encoding)**.

As per Claims 28-30, the limitations are similar to those in Claims 15-17, and so are rejected under similar rationale.

4.   Claims 18, 19, 31-32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 15 above, and further in view of Takahashi (US 6,064,958).

Consider claim 18: Li, Eberman, and Chen disclose likelihoods are probabilities. Li, Eberman, and Chen do not specifically disclose probability distributions, however Takahashi discloses probability distributions **(see Col. 14, lines 55-65, where Takahashi discusses a distribution)**. It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use probability distributions as taught by Takahashi, thus providing pattern recognition using probabilistic models, as discussed by Takahashi **(see Col. 4, line 65-Col. 5, line 10)**.

Consider claim 19: Li, Eberman, Chen and Takahashi disclose distance between said first and second likelihoods is calculated as a symmetric Kullback distance between probability distributions **(see Col. 14, lines 55-65, where Takahashi discusses Kallback information)**.

As per Cliams 31-32, their limitations are similar to those in Claims 18-19, and so are rejected under similar rationale.

5.   Claims 20 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 15 above, and further in view of Huang (US 6,801,895).

Consider claims 20 and 33: Li, Eberman, and Chen disclose threshold value is a fuzzy set.

Li, Eberman, and Chen do not specifically disclose a fuzzy set, however Huang discloses a fuzzy set **(see Col. 6, lines 44-67, where Huang discusses a fuzzy threshold)**. It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use a fuzzy set as taught by Huang, thus simplifying a process, as discussed by Huang **(see Col. 2, lines 11-17)**.

6.   Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 25 above, and further in view of Levine (US 6,118,392).

Consider claim 26 (and the above 101 rejection): Li, Eberman, and Chen disclose a buffer.

Li, Eberman, and Chen do not specifically disclose a lookahead buffer, however Levine discloses a lookahead buffer **(see Col. 13, lines 40-55, where Levine discusses a lookahead buffer)**. It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use a lookahead buffer as taught by Levine, thus providing particularly good compression, as discussed by Levine **(see Col. 1, line 65- Col. 2, line 4)**.

Allowable Subject Matter

1.   Claims 21, 22 and 34-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

3.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

     Any inquiry concerning this communication or earlier communications from the

examiner should be directed to ERIC YEN whose telephone number is (571)272-4249.

The examiner can normally be reached on M-F 7:30-4:00.

     If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

     Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EY 9/7/08

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626